PALM-BASED COSMETIC PRODUCTS WITH ROSELLE EXTRACT

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For the past few years, MPOB has been approached by many small- and medium-scale cosmetic companies to help develop a product or a range of cosmetic products utilizing palm-based oleochemicals as the major raw material.This positive development is not unfounded as recent development in the cosmetic industry is advocating the use of natural, renewable and plant derived ingredients. Currently, palm-based oleochemicals, such as glycerin, fatty alcohol, fatty esters and fatty amine are widely used in cosmetics and personal care formulations to serve various functions such as emulsifiers, humectants, emollients, lubricants and conditioners.The range of palm-based skin care products with roselle extract as the active ingredient highlighted in this publication is a result of a collaboration between MPOB and Monrose Sdn Bhd.

Roselle or *Hibiscus sabdariffa* L. is a member of the Malvaceae family. It is also known as Florida Cranberry due to its similarity in taste and flavour to cranberry. Believed to have originated from Sudan, roselle is grown as a rain-fed crop in Sudan and Egypt. Today, it is widely grown in the tropics (Monrose product brochure). Nutritional analysis carried out at different parts of the world have shown that roselle edible portions contain different types of vitamins and minerals as shown in *Table 1* (Morton, 1987).

Roselle extract has been used in skin care products such as skin protecting creams/lotions ((Iwayama *et al.,* 1982). It is also widely used in hair care products such as shampoos, conditioners and hair tonics (Suetsugu *et al.,* 2000).

Roselle extract is rich in ascorbic acid, citric acid and other fruit acid which can be grouped as α-hydroxy acid (AHA). AHA has been proven to be effective in minimizing the appearance of wrinkles, age spots and fine lines especially on facial skin. They work by loosening the bonding of the upper dermis, thereby gently exfoliating the dead dull skin cells (http://abratherpeutics.com/articles/ofa.html.). Another active compound, which can be isolated from roselle extract is anthocyanins. It is a natural colorant and has antioxidant activity which is equivalent to vitamin E (Wang, 1998). Anthocyanins are used for their antioxidant properties in skin care products, particularly for mature skins and sunscreen products. An analysis on roselle extract showed that it contained high concentration of vitamin C, vitamin A, thiamine and riboflavin. Below is the summary for each of the products developed for Monrose Sdn. Bhd.

PALM-BASED FACIAL CLEANSER

Most facial contamination is oily, either from make-up or sebum combined with perspiration and atmospheric pollution. These oily residues can be removed by using facial cleanser, which is normally in the milk form of (pourable) oil in water emulsion. This palm-based cleansing milk with roselle extract is formulated with high quality palm-based materials and mild emulsifiers to emulsify the oil residues, enabling it to be removed with damp cotton wool, leaving the skin feeling cleaned and refreshed. The ability of the formulation to remove soil is evaluated using silk soiled cloth (silk soiled with cosmetic soil/sebum) at 0.1% concentration, water hardness 50 ppm and 350 ppm and room temperature. The results indicated that palm-based cleansing milk with roselle extract removes soil better at 50 ppm and 350 ppm water hardness compared to the commercial sample as indicated in *Figure 1*.

This palm-based cleansing milk is also formulated with mild surfactants to provide a cleansing and moisturizing effect to the skin. Evaluation by *in vitro* irritection assay for ocular irritation found that the product fall into the minimal eye irritant potential with irritection draize equivalent (IDE) score of between 6.4 - 9.8 only (*Table 3*). *Table 2* showed the qualifying prediction for the ocular irritancy classification.

TABLE 1. ROSELLE EDIBLE PORTION (per 100 g)

Calyx, fresh	mg	Leaves, fresh	%	Seeds	%	Calyx, fresh	*
Moisture	9 200	Moisture	86.2	Moisture	12.9	Arginine	3.6
Protein	1 145	Protein	1.7-3.2	Protein	3.29	Cytine	1.3
Fat	2 610	Fat	1.1	Fatty oil	16.8	Histidine	1.5
Fibre	12 000	Carbohydrates	10	Cellulose	16.8	Isoleucine	3.0
Ash	6 900	Ash	1	Pentosans	15.8	Leucine	5.0
Calcium	1 263	Calcium	0.18	Starch	11.1	Lysine	3.9
Phosphorus	273.2	Phosphorus	0.04			Methionine	1.0
Iron	8.98	Iron	0.0054			Phenylalanine	3.2
Carotene	0.029	Malic acid	1.25			Threonine	3.0
Thiamine	0.117					Tryptophan	-
Riboflavin	0.277 mg					Tyrosine	2.2
Niacin	3.765 mg					Valine	16.3
Ascorbic acid	6.7 mg					Aspartic acid	7.2
						Glutamic acid	3.7
						Alanine	3.8
						Glycine	5.6
						Proline	3.5
						Serine	
						Amino acids	
						*(N=16p.100)	

TABLE 2. PREDICTED OCULAR IRRITANCY CLASSIFICATION

Irritection draize equivalent (IDE) score	Predicted ocular irritancy classification
0.0 - 12.5	Minimal irritant
12.5 - 30.0	Mild irritant
30.0 - 51.0	Moderate irritant
> 51.0	Severe irritant

TABLE 3. OCULAR IRRITANCY CLASSIFICATION FOR PALM-BASED CLEANSING MILK WITH ROSELLE EXTRACT

Sample description	Dose µl	IDE score	Predicted ocular irritancy classification
Cleansing milk	25	6.4	Minimal irritant
	50	9.4	Minimal irritant
	75	9.4	Minimal irritant
	100	9.2	Minimal irritant
	125	9.8	Minimal irritant

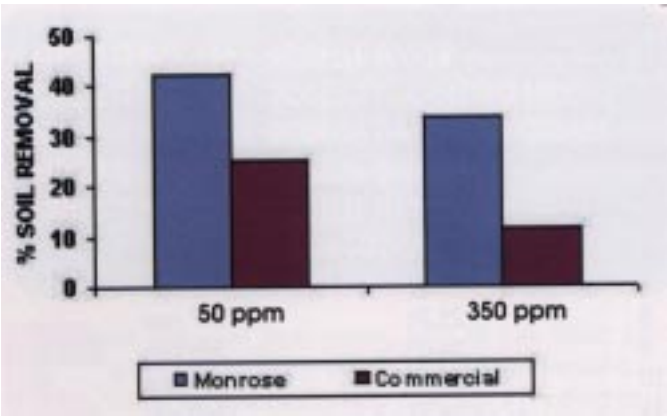

Figure 1. Detergency of facial cleansing milk at 0.1%/RT/silk.

PALM-BASED FACIAL TONER

This palm-based facial toner formulation is intended to be used after cleansing the face with facial cleansing milk to close the exposed pores after cleansing. The formulation contains natural moisturizing factor to impart smooth and soothing feel after application.

PALM-BASED MOISTURIZING CREAM

When our skin is clean and refresh, it needs protection and replenishment of lost natural oils and moisture regulators. Palm-based moisturizing cream with roselle is particularly designed to be worn during daytime to protect the skin from the environment. The presence of roselle extract which is rich in natural vitamin C, vitamin A, thiamine and riboflavin helps to moisturize the skin throughout the day. Efficacy study conducted on 20 human volunteers showed that the product is able to moisturize the skin after one application and the skin remains moisturized even after 4 hr of application compared to the untreated area. The study also showed that the presence of roselle extract (DC2) further improved skin moisture as shown in *Figure 2* compared to the placebo (DC3 - without roselle extract).

PALM-BASED HAND AND BODY LOTION

This product is formulate to be used on hand and all over the body to help moisturize the skin at all times. Efficacy

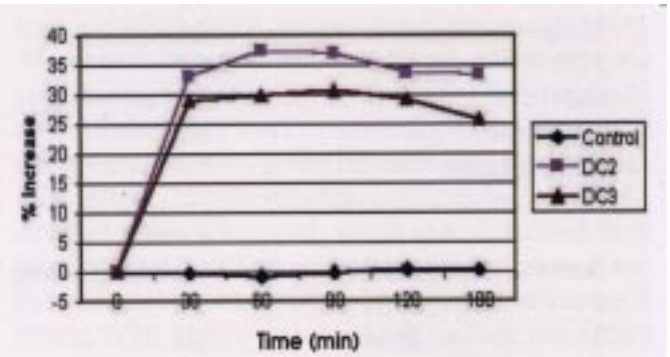

Figure 2. Increase in moisture treated with cream vs. untreated.

study conducted on the volar arms of 20 volunteers showed that the product was able to significantly increase skin moisture after just one application and remained moisturized for another 3 hr compared to the untreated area. HB3, that is the hand and body lotion with roselle extract also showed better performance compared to the base formulation (HB2 - without roselle extract) as in *Figure 3*.

PALM-BASED SUNBLOCK CREAM

The main objective of creating a sunblock cream is to protect the skin from the harmful effect of UV radiation. This palm-based sunblock cream is a 2 in 1 formula formulated to act as foundation for the face while protecting it from the harmful effect of UV radiation. The cream has a sun protection factor (SPF) of 25 as shown in *Table 4*. It is also enriched with the natural goodness of natural palm-based vitamin E, A and Co-Enzyme Q10.

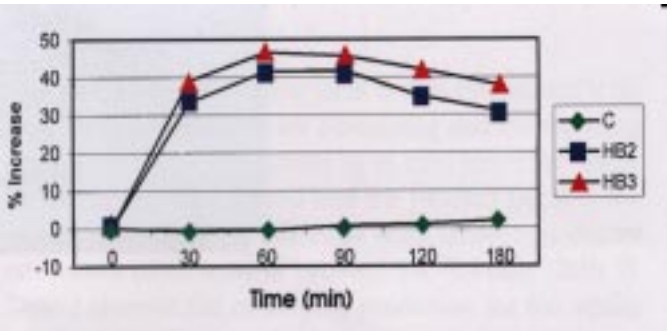

Figure 3. Increase in moisturising effect treated with HB lotion vs. control (untreated) on volar arm.

TABLE 4. SPF DATA FOR SUNBLOCK CREAM WITH ROSELLE EXTRACT

Labsphere Ultraviolet Transmittance Analyser
SPF Report

Sample:		MON 002/002			
Operator:		Zuhairi			
Client:		AOTC/Rubaah			
Comment:		Heating			
Date:		14 Mar 2002			
Wavelength Range:		290 - 400 nm			
Units:		SPF	T(UVA)	T(UVB)	
# of Scans:		11	11	11	
Mean:		24.8	27.32%	1.71%	
STD:		1.7	0.44%	0.19%	
COV:		6.71%	1.61%	10.97%	
UVA Ratio:		0.38			
Star Category:		*	MODERATE		

Scan #	SPF	Critical Wavelength (nm)	Scan #	SPF	Critical Wavelength (nm)
1	25.34	369	7	23.57	369 nm
2	25.44	368	8	29.36	367 nm
3	23.30	369	9	24.05	369 nm
4	24.53	368	10	24.64	369 nm
5	25.01	368	11	24.51	369 nm
6	23.47	369	12		

REFERENCES

MONROSE PRODUCT BROCHURE.

MORTON, J (1987). Roselle *Hibiscus sabdariffa* L. (http://www.hort.purdue.edu/newcrop/morton/roselle.html).

IWAYAMA, Y *et al.* (1982). Japanese patent JP 57099517.

SUETSUGU, K *et al.* (2000). Japanese patent JP 2000154134.

http://abratherapeutics.com/articles/ofa.html. Organic fruit acids.

WANG, H (1998). Agricultural Research Service. United States Department of Agriculture.

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